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FILE 'CA' ENTERED AT 18:14:57 ON 05 APR 2006

L1 1521977 S (PARTICLE OR PARTICULATE OR COLLOID? OR NANOPART? OR NANOCRYST?  
OR NANOCLUST? OR CLUSTER)  
L2 85800 S L1(7A) (COPPER OR CU OR GOLD OR AU OR SILVER OR AG OR PLATINUM OR  
PT OR PALLADIUM OR PD)  
L3 4852 S L1(7A) (COPPER OR CU OR GOLD OR AU OR SILVER OR AG OR PLATINUM OR  
PT OR PALLADIUM OR PD) (6A) (STABILIZ? OR STABILIS? OR SELF  
ASSEMBL? OR PASSIVAT? OR PROTECT? OR SAM OR ENCAPULAT? OR LIGAND  
OR MONOLAYER)  
L4 46 S L3 AND FATTY  
L5 497 S L3 AND (HYDROX? OR OH OR HALOGEN OR CL OR CHLORINE CHLORO?)  
L6 164 S L4-5 NOT PY>1996  
L7 135 S L6 NOT(SILVER OR AG) (1A) (HALIDE OR CHLORIDE)  
L8 62090 S LAYER(2W) LAYER OR ALTERNAT? (2A) LAYER?  
L9 722 S L2 AND L8  
L10 265 S L9 NOT PY>1996  
L11 14 S L3 AND L10  
L12 269455 S (3 OR THREE) (1A) (D OR DIMENSION?) OR 3D  
L13 7635 S L1(8A) L12  
L14 2923 S L13 NOT PY>1996  
L15 8 S L3 AND L14  
L16 156 S L7, L11, L15

=> d bib, ab l16 1-156

$\alpha\beta$  L16 ANSWER 3 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 126:149055 CA

TI Formation of noble metal particles by ultrasonic irradiation

AU Okitsu, K.; Mizukoshi, Y.; Bandow, H.; Maeda, Y.; Yamamoto, T.; Nagata, Y.

CS Department of Applied Materials Science, College of Engineering, Osaka Prefecture University, Sakai, 593, Japan

SO Ultrasonics Sonochemistry (1996), 3(3), S249-S251

AB Sonochem.-prepn. of metal nanoparticles (e.g., Ag, Pd, Au, Pt, Rh) with a fairly narrow size distribution (e.g., ~ 5 nm for Pd particles obtained from a 1.0 mM Pd(II) in polyethylene glycol monostearate soln.) is described. The authors suggest 3 different redn. pathways under sonication: (1) redn. by H atoms; (2) redn. by secondary reducing radicals formed by H abstraction from org. additives with OH radicals and H atoms; (3) redn. by radicals formed from pyrolysis of the additives at the interfacial region between cavitation bubbles and the bulk soln. Redn. of Ag(I) and Pt(II) proceeds mainly through reaction pathway (2). In the cases of Pd(II) and Au(III), the redn. mainly proceeds through reaction pathway (3). The redn. of Rh(III) was not achieved under the same conditions; however, by the addn. of Na formate, redn. occurred and the prepn. of Rh particles succeeded.

L16 ANSWER 11 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 125:168732 CA

TI Titanium catalyzed synthesis of poly(hexyl isocyanate) covalently bound to a gold nanoparticle

AU Huber, Dale L.; Carlson, Greg; Gonsalves, Kenneth E.; Seery, Thomas A.  
P.  
CS Polymer Science Program, University Connecticut, Storrs, CT, 06269, USA  
SO Polymeric Materials Science and Engineering (1996), 75, 265-266  
AB **Gold nanoparticles** were **stabilized** by a mixt. of 1-dodecanethiol and 11-  
**hydroxyundecanethiol** leading to a nanoparticle with well-defined  
proportion of terminal **hydroxyl** groups. The **hydroxyl** groups were  
coordinated with  $\text{TiCl}_4$  and used to catalyze the polymn. of hexyl  
isocyanate.

$\alpha\beta\sigma\text{L16}$  ANSWER 12 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 125:151911 CA

TI Structure, Dynamics, and Thermodynamics of **Passivated Gold  
Nanocrystallites** and Their Assemblies

AU Luedtke, W. D.; Landman, Uzi

CS School of Physics, Georgia Institute of Technology, Atlanta, GA, 30332,  
USA

SO Journal of Physical Chemistry (1996), 100(32), 13323-13329

AB The structure, dynamics, and thermodyn. of **Au nanocrystallites passivated**  
by alkylthiolate **monolayers** were studied by mol. dynamics simulations in  
different environments (e.g., as isolated gas-phase **clusters**, adsorbed on  
a graphite surface, assembled into **3-dimensional** superlattices). The  
packing arrangements and densities of the **monolayers passivating** the  
facets of the core **Au nanocrystallites** differ from those found on  
extended **Au** surfaces, exhibiting organization into mol. bundles of  
preferred orientations which upon heating undergo a reversible melting  
transition from the ordered bundled state to a uniform intermol.  
orientational distribution. The equil. geometries of adsorbed  
nanocrystallites depend on the chain length of the passivating mols.  
which effectively lubricate the interface between the **Au** core and the  
graphite surface conferring high surface mobility to the crystallites,  
involving a collective slip-diffusion mechanism. The room-temp. equil.  
structure of the superlattice made of  $\text{Au}_{140}(\text{C}_{12}\text{H}_{25}\text{S})_{62}$  nanocrystallites  
is predicted to be tetragonally distorted fcc with enhanced  
orientational bundling of the passivating mols. along the direction of  
the tetragonal distortion. The cohesion of the superlattice derives  
predominantly from the interactions between the interlocking mol.  
bundles. Passivation by shorter chain mols. ( $\text{Au}_{140}(\text{C}_4\text{H}_9\text{S})_{62}$ ) results in  
a room-temp. bcc superlattice structure (transforming to a fcc lattice  
at higher temps.).

$\alpha\beta\sigma\text{L16}$  ANSWER 14 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 124:300856 CA

TI Monolayers in three dimensions: synthesis and electrochemistry of  $\omega$ -  
functionalized alkanethiolate-**stabilized gold cluster** compounds

AU Hostetler, Michael J.; Green, Stephen J.; Stokes, Jennifer J.; Murray,  
Royce W.

CS Kenan Laboratories of Chemistry, University of North Carolina, Chapel  
Hill, NC, 27599-3290, USA

SO Journal of the American Chemical Society (1996), 118(17), 4212-13

AB The synthesis and characterization of **Au cluster compds.** contg. a mixt.  
of alkanethiolate and  $\omega$ -substituted alkanethiolate ligands are

reported. Cluster mols. prepd. with alkanethiolate ligands, according to previous work, have a ~1.2 nm radius Au core that, modeled as a 309-Au atom cubooctahedron, bears a monolayer ligand skin of ~95 alkenethiolate chains. The  $\omega$ -functionalized clusters are synthesized by place exchange reactions in soln. mixts. of alkanethiolate cluster mols. and  $\omega$ -substituted alkanethiols, where the  $\omega$ -substituent can be -Br, -CN, vinyl, or ferrocenyl. The reaction products, according to <sup>1</sup>H NMR spectroscopy, include cluster mols. with as many as 44 bromide and 15 ferrocenyl  $\omega$ -substituents. Steric  $\omega$ -substituent interactions appear to constrain the extent of place exchange. Ferrocenyl-substituted clusters are electroactive in CH<sub>2</sub>Cl<sub>2</sub> solns. as adsorbed monolayers and as diffusing solutes. The mass transport behavior indicates that as many as 15 ferrocene units in a substituted cluster mol. can be oxidized at an electrode surface over a potential range as narrow as that required to oxidize a ferrocene monomer, i.e., the cluster has promise as a reagent that delivers multiple equiv. of redox activity at nearly identical formal potentials. The Au cores of the clusters also exhibit "double layer" charging behavior and are thus true mol. "nanoelectrodes".

L16 ANSWER 17 OF 156 CA COPYRIGHT 2006 ACS on STN  
AN 124:127954 CA  
TI Polymer-protected palladium and platinum catalysts in the nanometer size range  
AU Mayer, A. B. R.; Mark, J. E.  
CS Polymer Research Center, University Cincinnati, Cincinnati, OH, 45221-0172, USA  
SO Polymeric Materials Science and Engineering (1995), 73, 220-1  
AB We report some results for several nonionic polymers and cationic polyelectrolytes and their ability to **stabilize palladium and platinum colloids**. Both steric and electrostatic stabilization of the metal colloid can be combined by the use of polyelectrolytes. In addn., the catalytic activity of these systems has been tested by the hydrogenation of cyclohexene as a model reaction.

L16 ANSWER 26 OF 156 CA COPYRIGHT 2006 ACS on STN  
AN 121:188334 CA  
TI Preparation and catalytic properties of NR<sub>4</sub><sup>+</sup>-**stabilized palladium colloids**  
AU Boennemann, Helmut; Brinkmann, Rainer; Neiteler, Peter  
CS Max-Planck-Institut Kohlenforschung, Muelheim, D-45466, Germany  
SO Applied Organometallic Chemistry (1994), 8(4), 361-78  
AB Palladium colloids revealing narrow particle size distributions can be obtained by chem. redn. using tetra-alkylammonium hydrotriorganoborates. Combining the stabilizing agent [NR<sub>4</sub><sup>+</sup>] with the reducing agent [BET<sub>3</sub>H<sup>-</sup>] provides a high concn. of the protecting group at the redn. center. Alternatively, NR<sub>4</sub>X (X = **halogen**) may be coupled to the metal salt prior to the redn. step: addn. of N(octyl)<sub>4</sub>Br to Pd(ac)<sub>2</sub> in THF, for example, evokes an active interaction between the stabilizing agent and the metal salt. Redn. of NR<sub>4</sub><sup>+</sup>-stabilized palladium salts with simple reducing agents such as hydrogen at room temp. yields stable palladium organosols which may be isolated in the form of redispersible powders. The anion of the palladium salt is crucial for the success of the colloid

synthesis. Electron microscopy shows that the mean particle size ranges between 1.8 and 4.0 nm. An x-ray-photoelectron spectroscopic examn. demonstrated the presence of zerovalent palladium. These palladium colloids may serve as both homogeneous and heterogeneous hydrogenation catalysts. Adsorption of the colloids onto industrially important supports can be achieved without agglomeration of palladium particles. The std. activity of a charcoal catalyst contg. 5% of colloidal palladium detd. through the cinnamic acid std. test was found to exceed considerably the activity of the conventional tech. catalysts. In addn., the lifespan of the catalyst contg. a palladium colloid, isolated from the redn. of  $[N(octyl)_4]_2PdCl_2Br_2$  with hydrogen, is superior to conventionally prepd. palladium/charcoal (Pd/C) catalysts. For example, the activity of a conventional Pd/C catalyst is completely suppressed after  $38 \times 10^3$  catalytic cycles per Pd atom, whereas the colloidal Pd/C catalyst shows activity even after  $96 \times 10^3$  catalytic cycles.

L16 ANSWER 35 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 119:81098 CA

TI Selective catalytic hydrogenation of unsaturated model compounds with solvent **stabilized palladium colloid** catalysts

AU Behr, Arno; Schmidke, Heiko

CS Henkel K.-G.aA, Duesseldorf, W-4000/1, Germany

SO Chemie Ingenieur Technik (1993), 65(5), 568-9

LA German

AB Solvent-**stabilized** (DMF, propylene dicarbonate) **Pd colloid** catalysts proved their high activity and selectivity in the hydrogenation of certain model compds. (dienes, alkynes, diunsatd. **fatty acids**). The time dependence of intermediate and product formation as well as yields and selectivity are exemplary given for the hydrogenation of cis-1,4-hexadiene and 1-hexine. The catalysts also showed remarkable stability during the hydrogenation of polyunsatd. **fatty acids** (e.g. sunflower-) which generally contg. small amts. of catalyst poisons. Further advantages such as mild reaction conditions and simple catalyst sepn. from reaction mixts. are also discussed.

L16 ANSWER 54 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 113:198774 CA

TI Characterization of **silver colloid stabilization** by surface enhanced Raman scattering (SERS)

AU Zimmermann, F.; Wokaun, A.

CS Univ. Bayreuth, Bayreuth, D-8580, Germany

SO Progress in Colloid & Polymer Science (1990), 81(Trends Colloid Interface Sci. 4), 242-7

AB The binding and exchange of **stabilizing ligands** on the surface of **colloidal silver particles** is studied by surface enhanced Raman spectroscopy. Primary stabilizers present during colloid synthesis (e.g., the EDTA dianion) can be replaced by the cationic surfactant CTAB. To further elucidate this process, model systems are investigated. Choline ions are found to bind to colloidal silver particles through the trimethylammonium head group; the mol. exclusively exhibits the gauche conformation with respect to the  $C\alpha-C\beta$ -bond. Coadsorbed anions are important for the binding to the silver surface, which is covered by a layer of  $Ag^+$  ions. SERS intensities increase in

the sequence Br- < Cl- < OH-. Polyvinyl alc. is an excellent **stabilizer** for small (~3 nm radius) **colloidal silver** particles (prepd. by  $\gamma$ -irradn. in the group of A. Henglein (1981)). Surface enhanced Raman spectroscopy reveals that the polymer is bound to the silver surface via the **hydroxyl** groups. Strong signals obsd. for CH<sub>2</sub> deformational vibrations are consistent with an adsorption geometry in which segments of the polymer chain are running parallel to the colloid surface in a disordered conformation. Acetate groups present on the polymer due to incomplete hydrolysis of the polyvinyl acetate precursor give rise to intensive SERS signals, indicating that the carbonyl groups participate in the bonding to the colloid surface.

L16 ANSWER 73 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 109:189805 CA

TI Colloidal noble metal catalysts protected by surfactant micelles. Regioselectivity in the hydrogenation of unsaturated **fatty** acids in organized media

AU Toshima, Naoki; Takahashi, Tadahito

CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan

SO Chemistry Letters (1988), (4), 573-6

AB **Colloidal** dispersions of Pt and Pd **protected** by nonionic surfactants were prep'd. by photo-irradn. They work as catalysts for the hydrogenation of unsat'd. **fatty** acids and their sodium salts. Regioselectivity was obsd. in the hydrogenation in the organized media which surround the colloidal particles. Thus, 10-undecenoic acid was more rapidly hydrogenated than 2-undecenoic acid.

L16 ANSWER 78 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 106:226228 CA

TI Synthesis and characterization of small platinum particles formed by the chemical reduction of chloroplatinic acid

AU Van Rhee, P. R.; McKelvy, M. J.; Glaunsinger, W. S.

CS Dep. Chem., Arizona State Univ., Tempe, AZ, 85287, USA

SO Journal of Solid State Chemistry (1987), 67(1), 151-69

AB The prepn. of Pt particles by the chem. redn. of H<sub>2</sub>PtCl<sub>6</sub> was studied. The morphol. and size of the product depends on the nature of the reducing agent, the presence and type of protective agent, and the redn. conditions. By carefully controlling these parameters, Pt spheres (.simeq.20-30 Å diam), strands (.simeq.60 Å diam), and composites (.simeq.100-200 Å) can be prep'd. Poly(vinylpyrrolidone) is the optimum protective agent due to its low protective ratio and high purity. The distribution of particle diams. for the spherical particles can be described by a log-normal distribution function. The applicability of this chem.-redn. approach to other systems is outlined.

L16 ANSWER 84 OF 156 CA COPYRIGHT 2006 ACS on STN

AN 105:12747 CA

TI Preparation of polymer-**protected colloidal** dispersions of **copper**

AU Hirai, Hidefumi; Wakabayashi, Hidehiko; Komiyama, Makoto

CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan

SO Bulletin of the Chemical Society of Japan (1986), 59(2), 367-72

AB Colloidal Cu dispersions are prep'd. by reducing aq. Cu(II) ions with NaBH<sub>4</sub> or N<sub>2</sub>H<sub>4</sub> in the presence of various protective polymers, (poly(N-

vinyl-2-pyrrolidone), poly(vinyl alc.), poly(Me vinyl ether), poly (potassium vinyl sulfate), dextrin, amylopectin, methylamylopectin, methylcellulose, ethylcellulose, (2-**hydroxyethyl**)cellulose). The dispersions are black, reddish dark brown, or reddish brown homogeneous solns., and are stable under N at room temp. for >3 mo. Electron diffraction expts. indicate that Cu atoms in the colloidal particles are arranged in an ordered way, which is almost identical with that in a crystal of bulk Cu metal. At the charged molar ratio 40 of the monomeric residue of the protective polymer to Cu(II) ion, the av. diams. of the Cu particles, prepd. by using NaBPh<sub>4</sub>, is 50-150 Å, depending on the polymer used. When poly(N-vinyl-2-pyrrolidone) is used as **protective** polymer, the size of the **Cu particles** monotonously increases with increasing degree of polymn. of the polymer and also with decreasing amt. of polymer.

L16 ANSWER 94 OF 156 CA COPYRIGHT 2006 ACS on STN  
AN 95:171457 CA  
TI Conditions of organosol formation from bivalent-metal soaps in organic media  
AU Sugimura, Tokuko; Kitahara, Ayao  
CS Fac. Sci., Toho Univ., Funabashi, 274, Japan  
SO Nippon Kagaku Kaishi (1981), (8), 1212-16  
LA Japanese  
AB Colored organosols are prepd. by heating (110-180°) Cu, Zn, Cd, Sn, Pb, Mn, Co, Ni, and Al soaps of C4-11 **fatty** acids in triglycerides, paraffins, PhCH<sub>2</sub>OH, or **fatty** alcs. A sharp increase in the acid value of the solvent is obsd. at the temp. of formation of the organosol. Organosol formation is accompanied by the disappearance of carboxy groups and the appearance of carbonyl groups in the IR spectra. Electron microscopy and x-ray anal. indicate that the organosols prepd. from **Cu** soaps are fine **particles** of **Cu** oxide **stabilized** by the medium.

=> log y

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